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Amendments to the Claims

This listing of claims will replace all prior versions, or listings, or claims in the application.

Listing of Claims:

1. (currently amended) An inexpensive, ~~and~~ programmable, frequency independent, amplitude and phase shifting circuit comprising:

an enclosure comprising:

means for holding printed circuit boards; and

a front panel for receiving input and output signals;

a motherboard comprising:

means for supplying input signals through said front panel;

a power source;

digital control lines; and

a demultiplexer circuit board;

said demultiplexer circuit board within said motherboard comprising:

a plurality of signal receiving digital control lines from a digital output card in a personal computer;

a plurality of signal sending digital control lines routed to an amplitude/phase shifting circuit board; and

means for selecting a single amplifier for operator selected amplitude or phase gain change over a single frequency or sweep in frequency;

an amplitude/phase shifting circuit board comprising:

a plurality of programmable gain operational amplifiers, one amplifier selected at a time to have its gain changed when an operator desires a new amplitude or phase; and

a plurality of signal receiving digital control lines for receiving output lines from said demultiplexer, each of said digital control lines connected to a different multiplying operational amplifier chip select line on said amplitude/phase shifting circuit board; and

means for controlling said amplitude/phase shifting circuit.

2. (cancelled)

3. (original) The amplitude and phase shifting circuit of claim 1 wherein said enclosure mounts onto a standard electronics rack.

4. (cancelled)

5. (original) The amplitude and phase shifting circuit of claim 1 wherein said means for controlling said amplitude/phase shifting circuit comprises a digital output card from a personal computer.

6. (original) The amplitude and phase shifting circuit of claim 5 wherein said digital output card interfaces with said amplitude/phase shifting circuit through a 50 pin ribbon cable.

7. (original) The amplitude and phase shifting circuit of claim 5 wherein an operator interfaces with said digital output card through software.

8. (cancelled)

9. (currently amended) An inexpensive, programmable, <u>frequency independent,</u> multiple channel amplitude and phase shifting method comprising the steps of:

inputting sine and cosine signal waveforms to two programmable gain operational amplifiers on an amplitude/phase shifting circuit board;

summing said outputs of said two programmable gain operational amplifiers using one summing operational amplifier on said amplitude/phase shifting circuit board;

implementing four channels of said inputting and summing steps on said amplitude/phase shifting circuit board, each of said channels connected to a demultiplexer circuit board;

powering said demultiplexer circuit board and said amplitude/phase shifting circuit boards through a motherboard;

selecting one of said four channels for a gain change through said demultiplexer circuit board over a single frequency or sweep in frequency;

controlling said programmable, multiple channel amplitude and phase shifting circuit; and

sending an amplitude and phase shifted sinusoidal signal waveform to an output line interfacing with a panel on an enclosure containing said motherboard, said demultiplexer circuit board and said amplitude/phase shifting circuit board.

10. (cancelled)

11. (currently amended) The inexpensive, programmable, frequency independent, multiple channel amplitude and phase shifting method of claim 9 wherein said controlling step further comprises controlling said programmable, multiple channel amplitude and phase shifting circuit using a digital output card from a personal computer.

12. (currently amended) The inexpensive, programmable, frequency independent, multiple channel amplitude and phase shifting method of claim 11 wherein said controlling step further comprises:

controlling said programmable, multiple channel amplitude and phase shifting circuit using a digital output card from a personal computer; and

operator interfacing with said digital output card with software.

13. (cancelled)

14. (cancelled)

15. (currently amended) The inexpensive, programmable, frequency independent, multiple channel amplitude and phase shifting method of claim 9 wherein said selecting step further comprises the steps of:

determining timing and sequence of reading data lines from said motherboard;

storing data in a buffer; and

changing gain of a selected operational amplifier over a single frequency or sweep in frequency.

16. (currently amended) The inexpensive, programmable, frequency independent, multiple channel amplitude and phase shifting method of claim 9 wherein said inputting step further comprises inputting sine and cosine signal waveforms to two programmable gain operational amplifiers on an amplitude/phase shifting circuit board through a motherboard.